



PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Drinking Devices for Animals

I, MARGARET ELISE WALLACE, a British Subject of Jasper House, 127, Thornton Road, Cambridge, Cambridgeshire, England, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to drinking devices for animals and particularly to such devices for use in supplying desired amounts of drinking liquid, for example water, to rodent or like cages.

The main object of the invention is to provide an improved drinking device for use with rodent or like cages which enables a rodent or the like in the cage, to drink at will, desired amounts of liquid.

According to the invention, a drinking device for use with rodent or like cages comprises a trough for receiving and draining excess liquid through a drainage outlet, and a liquid supply connection leading to the upper end of a valve having a nozzle disposable in or adjacent to the cage so as to be within reach of a rodent or the like in the cage, said valve being normally loaded into a closed position and having a release element operable by the rodent or the like to open the valve, thereby allowing liquid to flow downwardly through the valve and issue directly from the nozzle into the mouth of the rodent or the like as desired.

In a preferred construction the valve comprises a body having means for attachment to the liquid supply connection, and a chamber communicating with the liquid supply connection and with an axial bore in the body, the release element being a pin extending through the bore, one end of the pin extending outside the body for engagement by the rodent or the like, the other end of the pin being enlarged to form a head disposed in the chamber and closing in substantially fluid-tight manner the entrance to the axial bore when the valve

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is in its closed position. The head of the pin is preferably conical and extends partially into the axial bore, the conical surface of the head forming a substantially fluid-tight seal with the edge of the entrance to the axial bore.

A further preferred construction of valve comprises a cylindrical body having an enlarged end portion, the body having a hollow portion communicating through a bore with an open-ended chamber in the end portion, a piston disposed freely in the hollow portion and forming a seal between the hollow portion and the bore, the piston having an extension passing freely through the bore into the chamber, to be engaged by the release element being a ball disposed in the chamber and forming a fluid-tight seal with the periphery of the open end of the chamber, displacement of the piston by movement of the release element allowing liquid to flow into the chamber and thence past the ball to a rodent or the like. The hollow body portion, bore and chamber are desirably all co-axial.

A liquid supply tank may be provided having an outlet connected to a pipe leading to the valve, a filter being provided in the pipe between the tank and the valve. The filter is preferably a sintered ceramic filter although any convenient filtering means may be employed.

Conveniently, the rodent or like cage, tank and pipes may be supported on a framework, and where more than one cage is to be supplied, the tank may be arranged to feed an elongated pipe running adjacent a row of the desired number of cages, valves being disposed at intervals along the pipe so that one or more valves is available for feeding each cage. Cages may be disposed in tiers at different levels and a supply tank may be provided to supply each tier. All the supply tanks are supplied with means such as a ballcock to maintain the liquid therein at a predetermined level.

In order that the invention may be more

fully understood, various embodiments in accordance therewith will now be described by way of example with reference to the drawing accompanying the Provisional Specification, in which:—

5 Figure 1 is a perspective view of a drinking device arranged for operation from an animal cage, showing the frame on which the supply tank, device and cage are supported.

10 Figure 2 shows one embodiment of a valve and its operating means for use with the device of the invention, the valve being shown in the closed position, and

15 Figure 3 is a perspective view of a trough disposed in the cage of Figure 1; and with reference to the accompanying Figure 4 showing a further embodiment of the valve.

Referring to the drawings, Figure 1 shows a drinking device arranged for feeding a rodent or like cage 1, comprising a trough 2 shown disposed in the corner of the cage 1, said trough having a drainage outlet 3 protruding through a wall 4 of the cage. A liquid supply connection shown as a pipe 5 of rectangular cross section leads to one or more valves 6 disposed above the cage 1 so as to be within reach of a rodent or the like in the cage. The pipe 5 is fed by a supply tank 7, the pipe and tank being connected by a flexible tube 8 as of a plastic for example, and the tank 7 having means shown as a ballcock 9 for maintaining the liquid in the tank at a predetermined level.

25 The tank 7 pipe 5 and cage 1 are supported on a framework 31, the pipe 5 running above the cage and having the valve 6 disposed in its under-surface so that the valve and its operating means are operable by a rodent or the like in the cage to allow the rodent or the like to drink the desired amount of liquid, e.g. water.

30 Figure 3 shows an embodiment of the trough of the device, attached to an animal cage 1, the trough being shown as generally funnel-shaped and having a bowl portion 10 for disposition beneath a valve or valves of the cage, the edges of the funnel being suitably shaped, at 11 as shown in Figure 1, to enable the trough to be clipped or otherwise secured to the edge 12 of the cage 1. The trough is provided with a drainage outlet 3 which protrudes through the wall 4 of the cage to convey unwanted liquid which drips from the valve to the exterior thereof. It will be understood that the bowl portion of the container may extend, if necessary the full length of a wall of the animal cage if several valves are disposed at intervals in the pipe adjacent thereto.

35 When a series of containers is fed from one supply tank the spouts of the troughs from all the cages may be arranged to discharge into a common drainage channel or the like which directs surplus liquid to a convenient disposal point.

Figure 2 shows an embodiment of a valve used with the liquid feed apparatus, consisting of a valve body 17, as of brass for example, with means shown as a screw thread 35 for attaching the valve to the pipe 5 and having an axial bore 18 and a wider axial bore forming a valve chamber 19. A valve pin 20, as of stainless steel for example, having an enlarged head, shown as a conical head 21, is arranged so that the pin 20 is disposed in the axial bore 18 and the conical head lies in the valve chamber 19, being urged into engagement with the edge 23 of the valve chamber 19 by the pressure of a head of water in the supply tank, the conical face 22 forming a substantially fluid tight seal with the edge 23. When the pin 20 is pushed upwards, as for example by the occupant of an animal container adjacent which the valve is placed, the face 22 of the conical head 21 is displaced from its seating on the edge 23 of the valve chamber and liquid can pass down the axial bore 18 into the container. The upper edge of the valve body 17 is provided with a lip 24, by burring over the edge for example, to prevent the pin 20 being pushed upwards out of the valve body. On release of the pin 20, the valve assumes once more its fluid tight position under the influence of the head of water and the flow of liquid to the cage is thereby impeded.

A further embodiment of valve for use with the apparatus of this invention is shown in Figure 4. This consists of a cylindrical valve body 25a having one end 26 enlarged and generally conical in shape. The cylindrical body has a hollow axial cylindrical portion 27a extending from its end remote from the conical portion over a substantial portion of its length, the portion 27a communicating through a narrow cylindrical bore 28a co-axial therewith with a co-axial chamber 29a formed in the conical portion 26 the end of the chamber forming an opening 30a in the apex of the conical portion 26. Around the periphery of the opening is a seating 34 on which normally rests a ball 36 disposed in the chamber to form a fluid-tight seal. The cylindrical portion 27 has an externally threaded section 38 for attachment to the pipe 5 (Figure 1).

Disposed freely in the hollow cylindrical portion 27 is a piston 31a of slightly smaller diameter than the said portion, one end of the piston forming a fluid-tight seal with the inner end of the portion 37 which latter acts as a seating 40. Formed integrally and co-axially with the piston 31a is a pin 32 passing freely down the bore 28a and resting with a small clearance between the free end 33 of the pin and the surface of the ball 36 when the piston 31a is resting on the inner end of the portion 37.

In order to drink from the valve a rodent must touch the ball to dislodge it from the seating 34, as a result of which the ball will

spin slightly and clear any residue in the water off the ball. The ball on being pressed upwards engages the end of the pin 32 after which further upward movement will push the piston 31a off its seating 40 and allow drinking fluid to pass down the bore 28a into the chamber 29a and so to the rodent.

In an alternative construction, the inner end of the portion 27 may be provided with an upstanding conical portion around the entrance to the bore 28a, the periphery of the upper end of the conical portion being a knife edge which engages with the lower end of the piston 31a, to form a fluid-tight seal.

It will be understood that although it is preferable, by reason of ease of manufacture, that the valves of this invention are symmetrical about an axis they may also be made with their various components having different axes.

It will be appreciated that the force necessary to open the valve may be regulated as desired by raising and lowering the supply tank with respect to the valve to adjust the head of liquid acting thereon and such an arrangement provides a valve which is satisfactorily fluid-tight in its closed position and at the same time light enough in operation to be usable by small rodents such as mice for example. When the apparatus is to be used by larger rodents the valve pin may be spring-loaded into the closed position to provide a resistance to operation in proportion to the strength of the rodent or the like.

The cage is closed by a perforated lid or preferably by means of bars 25 so spaced as to prevent the animal, for example a rodent, in the cage from escaping between them whilst allowing access by the animal to the valve or valves each of which is arranged to lie over a perforation or between bars.

When more than one supply tank is used, for instance when supplying two or more tiers of cages with liquid, the supply tanks are fed from a main supply tank 27 provided with a ballcock 28, a filter e.g. a sintered ceramic filter 29 being provided in this arrangement in the pipe 30 between the main tank and the supply tanks. A similar filter may also be included in the pipe 8. It will be understood that any convenient number of supply tanks may be provided at different levels, each feeding, if desired, a number of cages.

The pipes 5 are conveniently made from a suitable plastic material, as are the tubes connecting the supply tanks 7 to the pipes. The supporting framework is preferably made from metal e.g. wrought iron, or plastic or wood or combinations of these materials may be used.

As an alternative to stainless steel, the valve pin may be made of brass as is the valve body. The ball used in the embodiment of Fig 4 is preferably of bronze.

WHAT I CLAIM IS:—

1. A drinking device for use with rodent

or like cages, said device comprising a trough for receiving and draining excess liquid through a drainage outlet, and a liquid supply connection leading to the upper end of a valve having a nozzle disposable in or adjacent to the cage so as to be within reach of a rodent or the like in the cage, said valve being normally loaded into a closed position and having a release element operable by the rodent or the like to open the valve, thereby allowing liquid to flow downwardly through the valve and issue directly from the nozzle into the mouth of the rodent or the like as desired.

2. A device according to Claim 1 wherein the valve comprises a body having means for attachment to the liquid supply connection, and a chamber communicating with the liquid supply connection and with an axial bore in the body, the release element being a pin extending through the bore, one end of the pin extending outside the body for engagement by the rodent or the like the other end of the pin being enlarged to form a head disposed in the chamber and closing in substantially fluid-tight manner the entrance to the axial bore when the valve is in its closed position.

3. A device according to Claim 2 wherein the head of the pin is conical and extends partially into the axial bore, the conical surface of the head forming a substantially fluid-tight seal with the edge of the entrance to the axial bore.

4. A device according to Claim 1 wherein the valve comprises a cylindrical body having an enlarged end portion, the body having a hollow portion communicating through a bore with an open-ended chamber in the end portion, a piston disposed freely in the hollow portion and forming a seal between the hollow portion and the bore, the piston having an extension passing freely through the bore into the chamber, to be engaged by the release element being a ball disposed in the chamber and forming a fluid-tight seal with the periphery of the open end of the chamber, displacement of the piston by movement of the release element allowing liquid to flow into the chamber and thence past the ball to a rodent or the like.

5. A device according to Claim 4 wherein the hollow body portion, bore and chamber are all co-axial.

6. A device according to Claim 4 or Claim 5 wherein the sealing end of the piston engages in the closed position of the valve with a knife-edge seating formed around the entrance to the bore.

7. A device according to any of Claims 1 to 6 wherein the release element is spring loaded into a position in which the valve is closed.

8. A device according to any preceding claim wherein a liquid supply tank is provided having an outlet connected to a pipe leading to the valve, a filter being provided in the

pipe between the tank and the valve.

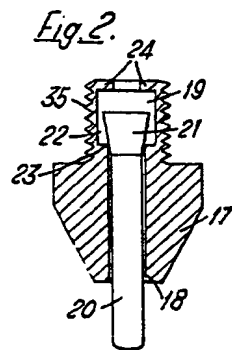
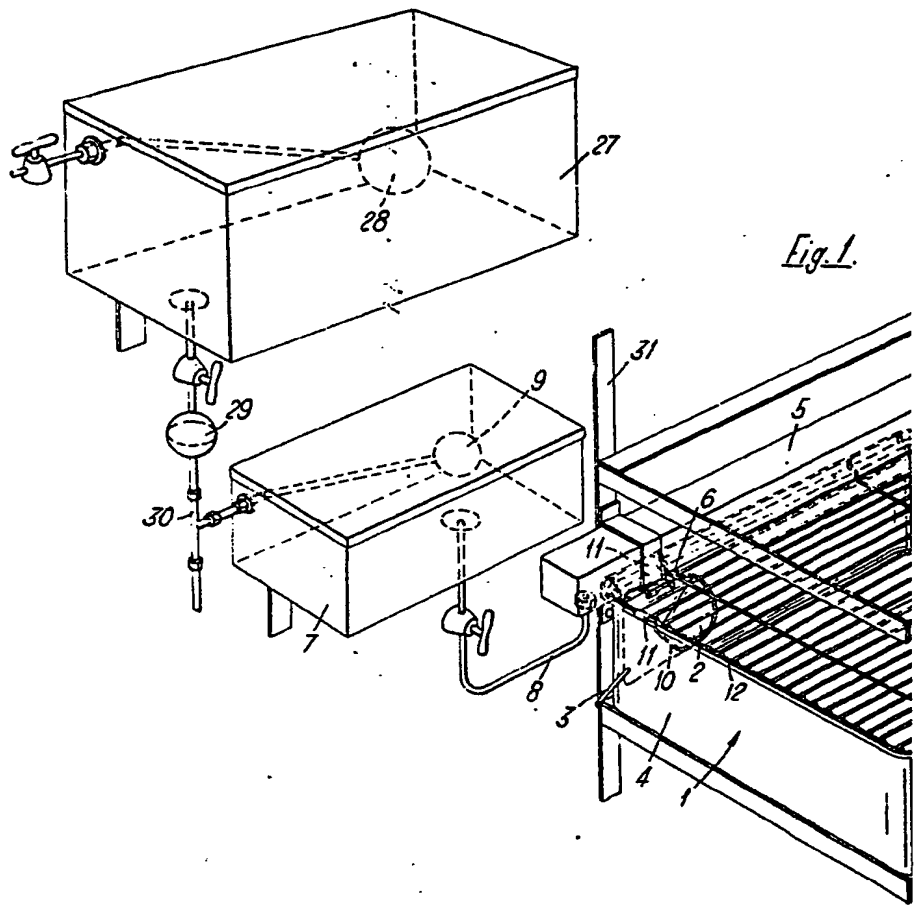
- 5 9. A rodent or like cage having one or more drinking devices according to any of Claims 1 to 8 supplied with liquid from a tank, a framework being provided to support the tank, pipes, and if desired, the cage.

10. A drinking device for use with rodent or like cages constructed and arranged to operate substantially as herein described with refer-

ence to the drawing accompanying the Provisional Specification and to the accompanying drawing. 10

PAGE, WHITE & FARRER,
Chartered Patent Agents,
27 Chancery Lane,
London, W.C.2.
Agents for the Applicant.

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PROVISIONAL SPECIFICATION

1 SHEET

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Fig. 1.

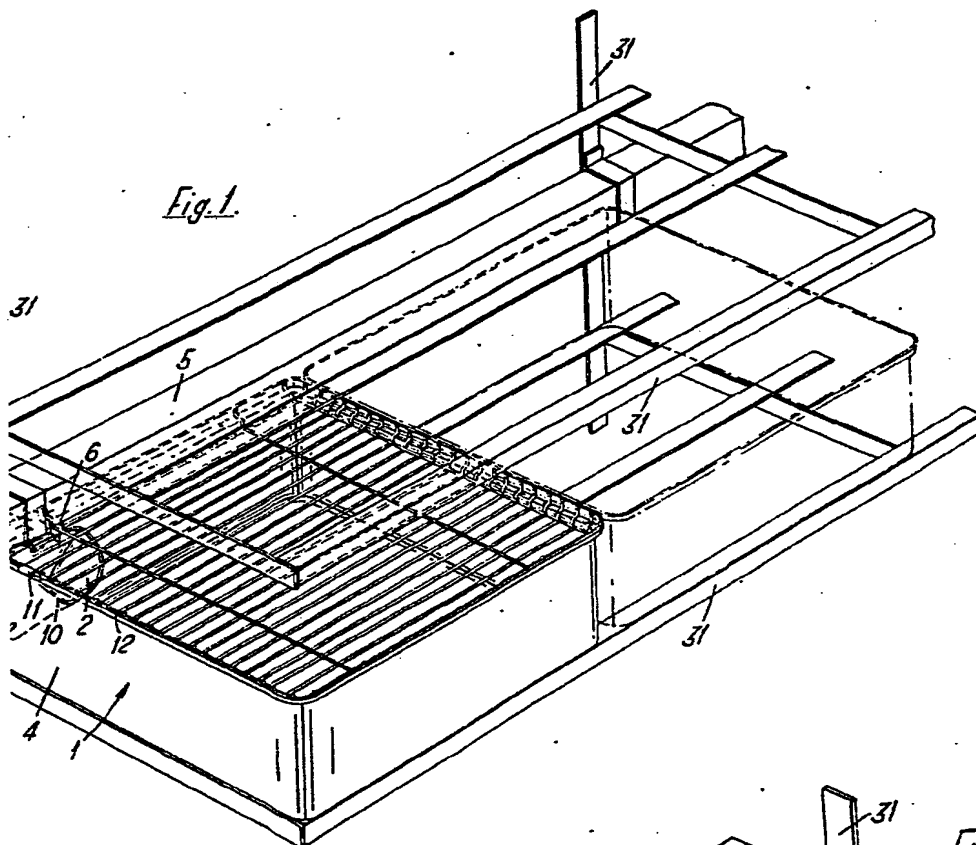
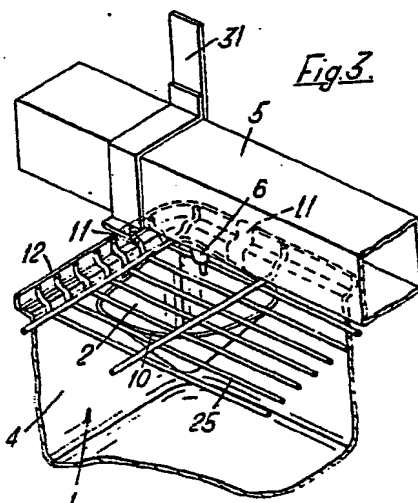
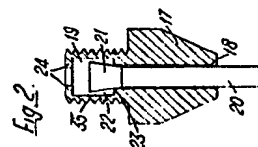
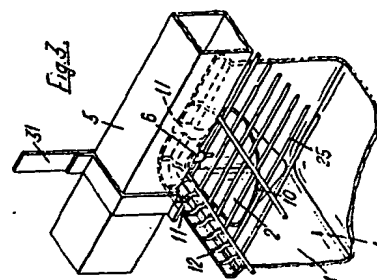
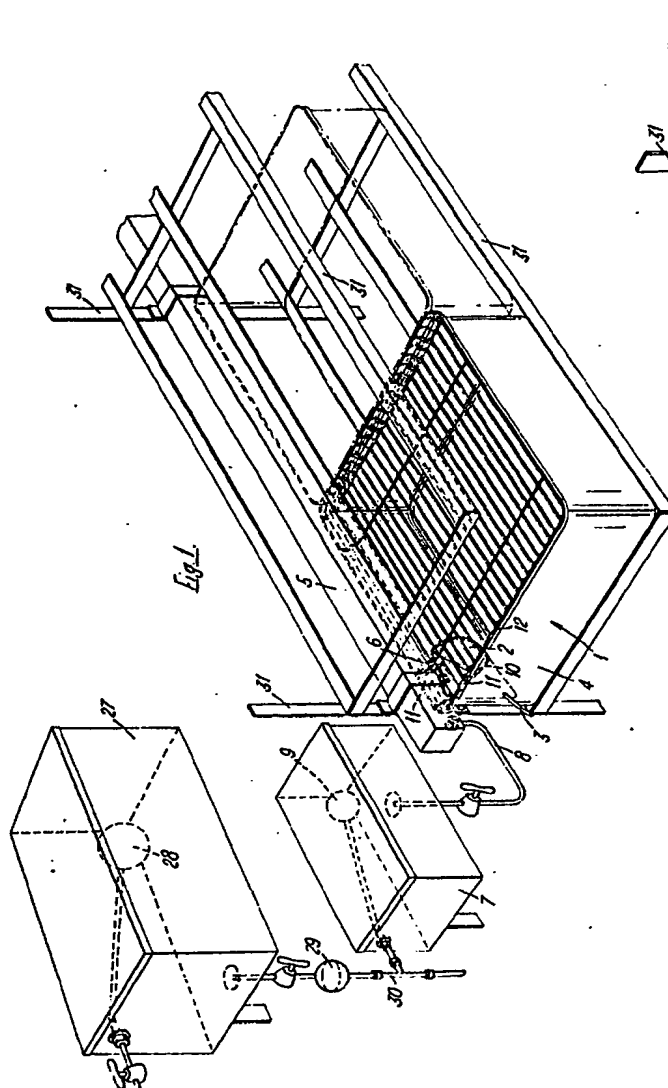


Fig. 3.





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FIG. 4.

